Serial No.: 10/826,667 Filed: April 16, 2004

Title: STIMULI RESPONSIVE MESOPOROUS MATERIALS FOR CONTROL OF

MOLECULAR TRANSPORT

IN THE CLAIMS

Please amend the claims as follows:

- 1. (Original) A mesoporous material comprising:
 - a porous network; and
- a stimuli responsive polymer dispersed within the porous network to control the transport of a molecular species through the porous network.
- 2. (Original) The material of claim 1, wherein the porous network includes materials of well-defined molecular dimensions.
- 3. (Original) The material of claim 1, wherein the porous network is externally and reversibly controlled to modulate the adsorption of the molecular species.
- 4. (Original) The material of claim 1, wherein the porous network changes thickness and surface energy as a function of temperature.
- 5. (Original) The material of claim 1, wherein the porous network comprises silica.
- 6. (Original) The material of claim 1, wherein the stimuli responsive polymer comprises a poly N-isopropylacrylamide polymer.
- 7. (Original) The material of claim 6, wherein the poly N-isopropylacrylamide polymer is extended and inhibits the transport of molecular species though the porous network at a low temperature.
- 8. (Original) The material of claim 6, wherein the poly N-isopropylacrylamide polymer is collapsed within the porous network and allows transport of molecular species through the porous network at a high temperature.

Response to Restriction Requirement

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- (Original) A method for forming a mesoporous material comprising:
 modifying pores of a mesoporous material with a stimuli responsive polymer; and
 maintaining the pores in an ordered porous network.
- 10. (Original) The method of claim 9, wherein the mesoporous material is formed such that the stimuli responsive polymer controls the transport and surface properties of the mesoporous material.
- 11. (Original) The method of claim 9, further comprising modifying the pores of the mesoporous material by atom transfer radical polymerization.
- 12. (Original) The method of claim 9, wherein the mesoporous material is formed using an acid catalyzed sol-gel process.
- 13. (Original) The method of claim 11, further comprising formation of an ordered mesoporous material prior to modifying by atom transfer radical polymerization.
- 14. (Original) The method of claim 9, wherein a versatile nanostructured surface is modified by poly(N-isopropyl acrylamide).
- 15. (Original) The method of claim 14, wherein the versatile nanostructured surface includes a nanoporous aluminum oxide formed via anodization.
- 16. (Original) The method of claim 9, wherein an inter-pore spacing of the porous network increased by at least about 30%.
- 17. (Original) The method of claim 9, wherein an inter-pore spacing of the porous network increased by at least about 40%.

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- 18. (Original) The method of claim 9, wherein the stimuli responsive polymer comprises poly N-isopropylacrylamide.
- 19. (Original) The method of claim 9, wherein the mesoporous material comprises silica.
- 20. (Original) The method of claim 9, wherein the mesoporous material comprises anodic aluminum oxide.
- 21. (New) The material of claim 1, wherein the porous network comprises anodic aluminum oxide.